Station Groups for Execution Resource Sharing

8 ML Active Stations
8 DEE Active Sations
2 ML columns
2 DEE columns
4 sharing groups

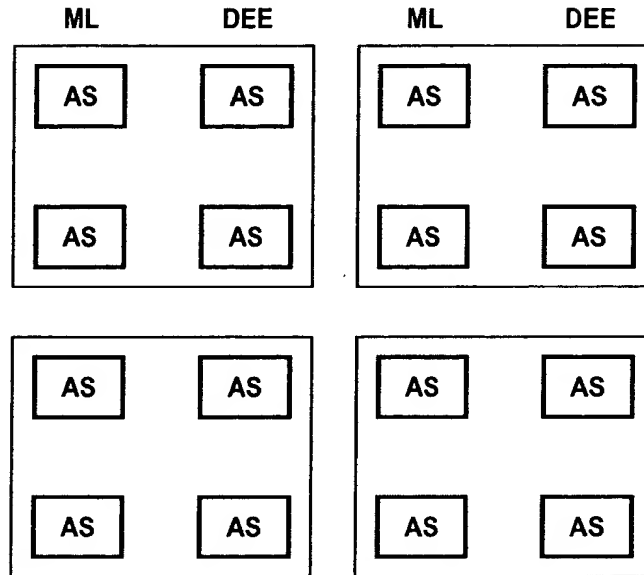
FIG. 1

High-level block diagram

8 ML Active Stations
8 DEE Active Sations
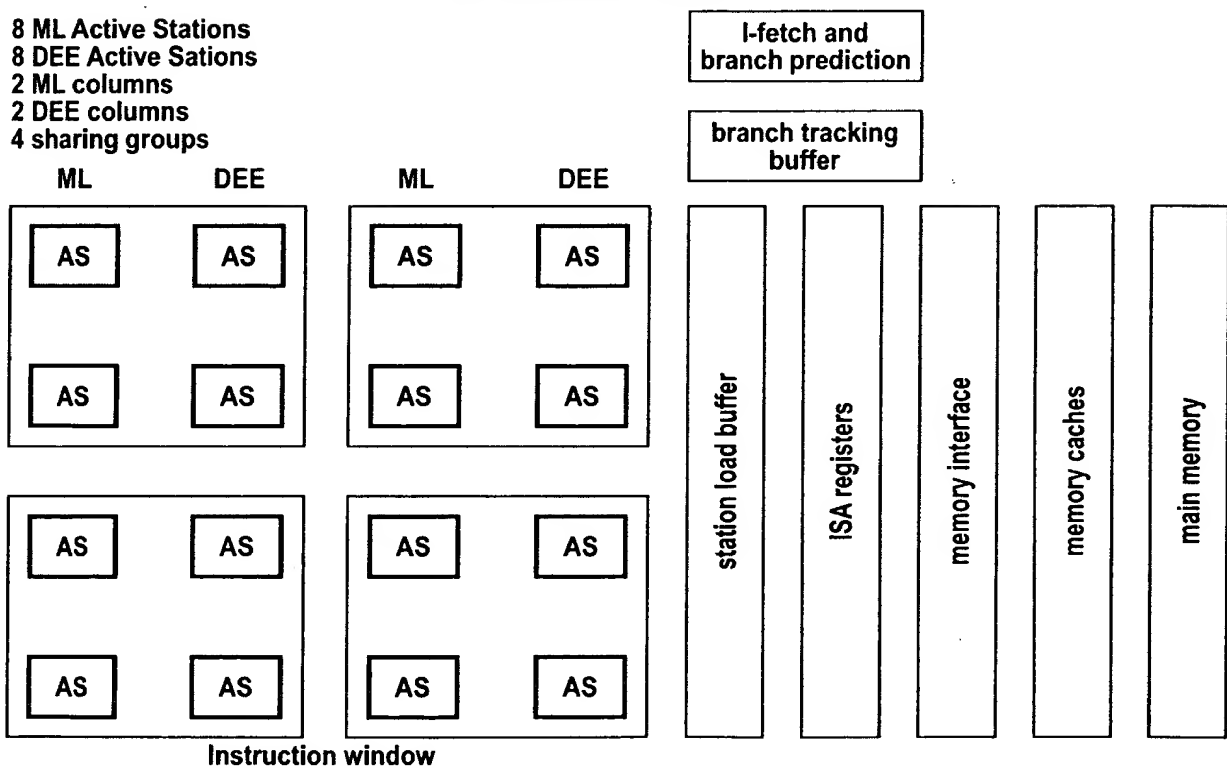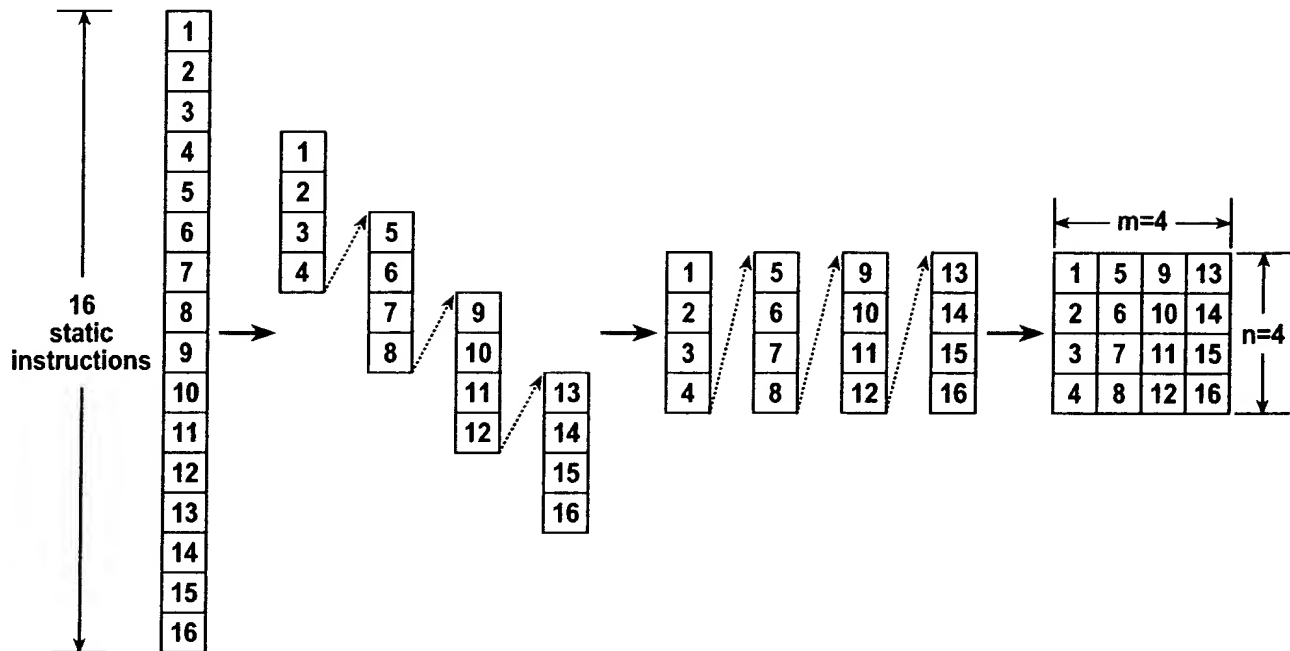2 ML columns
2 DEE columns
4 sharing groups

Instruction window

FIG. 2

022193-010210US
George B. F. Yee, Reg. No. 37,478
Telephone: 650-326-2400
Inventors: Augustus K. Uht et al.
Title: Resource Flow Computing Device
Sheets of drawings 2 of 7

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FIG. 3

Logical Organization

MainLine (ML) region (path)

1	5	9	13
2	6	10	14
3	7	11	15
4	8	12	16

DEE path 1

1	5
2	6
3	7
4	8

DEE path 2

1	5
2	6
3	7
4	8

Physical Organization

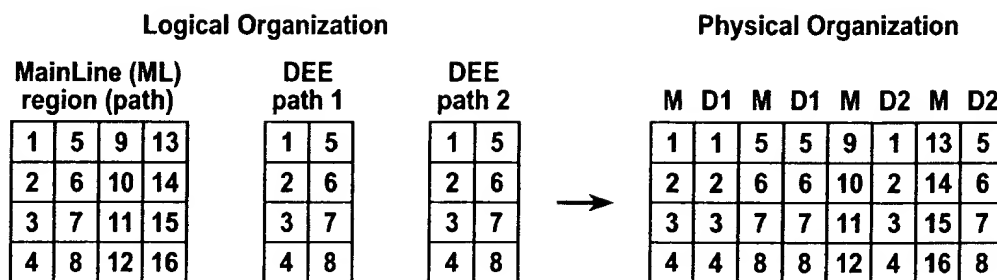| M	D1	M	D1	M	D2	M	D2
1	1	5	5	9	1	13	5
2	2	6	6	10	2	14	6
3	3	7	7	11	3	15	7
4	4	8	8	12	4	16	8

Instruction Window (IW), with Disjoint Eager Execution (DEE)
– each square is an active station –

FIG. 4

ISA Architectural Register Files

8 ML Active Stations
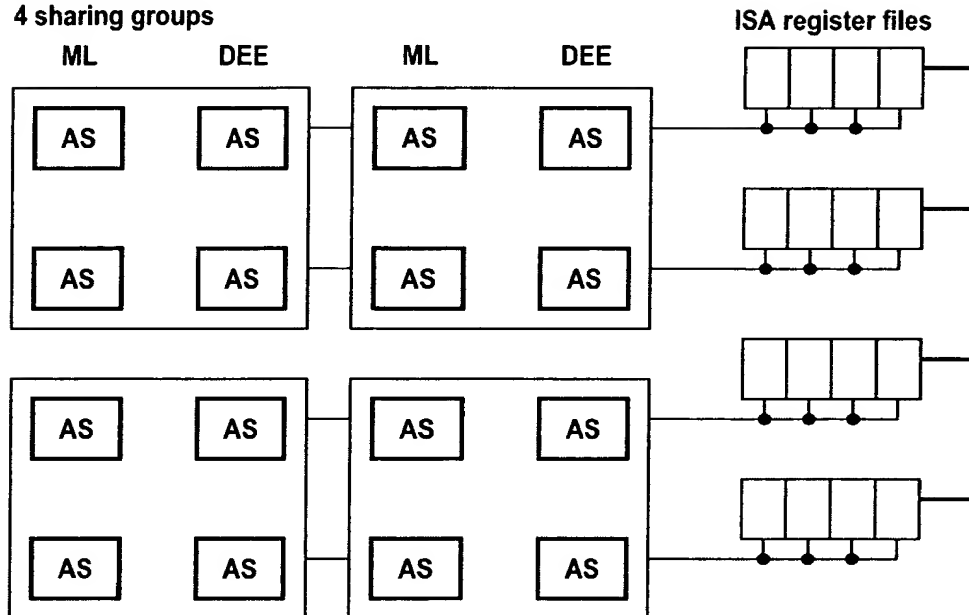**8 DEE Active Sations**
2 ML columns
2 DEE columns
4 sharing groups

FIG. 5

Memory Interface and Buffers

8 ML Active Stations
8 DEE Active Sations
2 ML columns
2 DEE columns
4 sharing groups

FIG. 6

from previous column   from previous column   from previous column

to next column   to next column   to next column

FIG. 7

1 sharing group
2 ML active stations
2 DEE active stations

forwarding buses from
previous sharing group

ML   DEE

forwarding
register

ISA register & memory buses

PE

ISA register & memory buses

active station sharing group

MUX

4 forwarding buses assumed;
for a fowarding span of 8
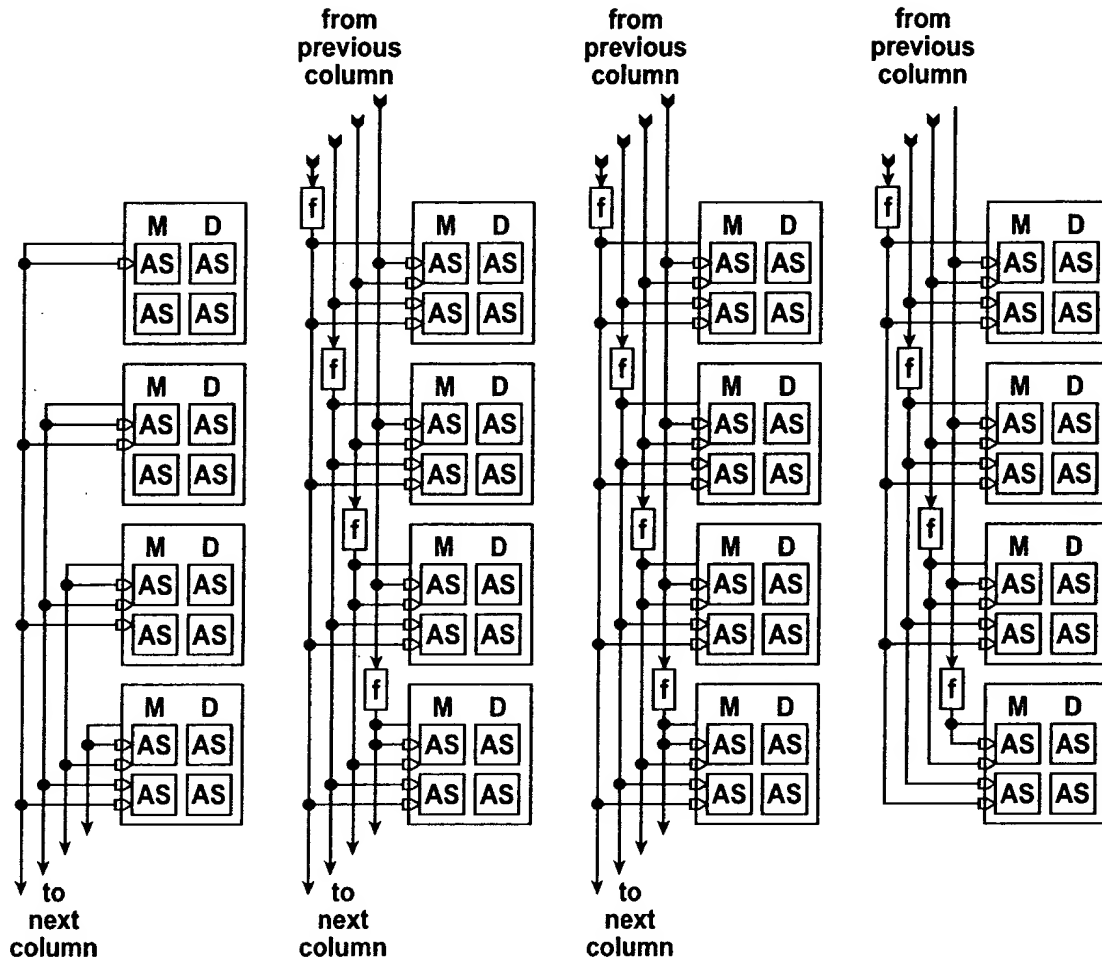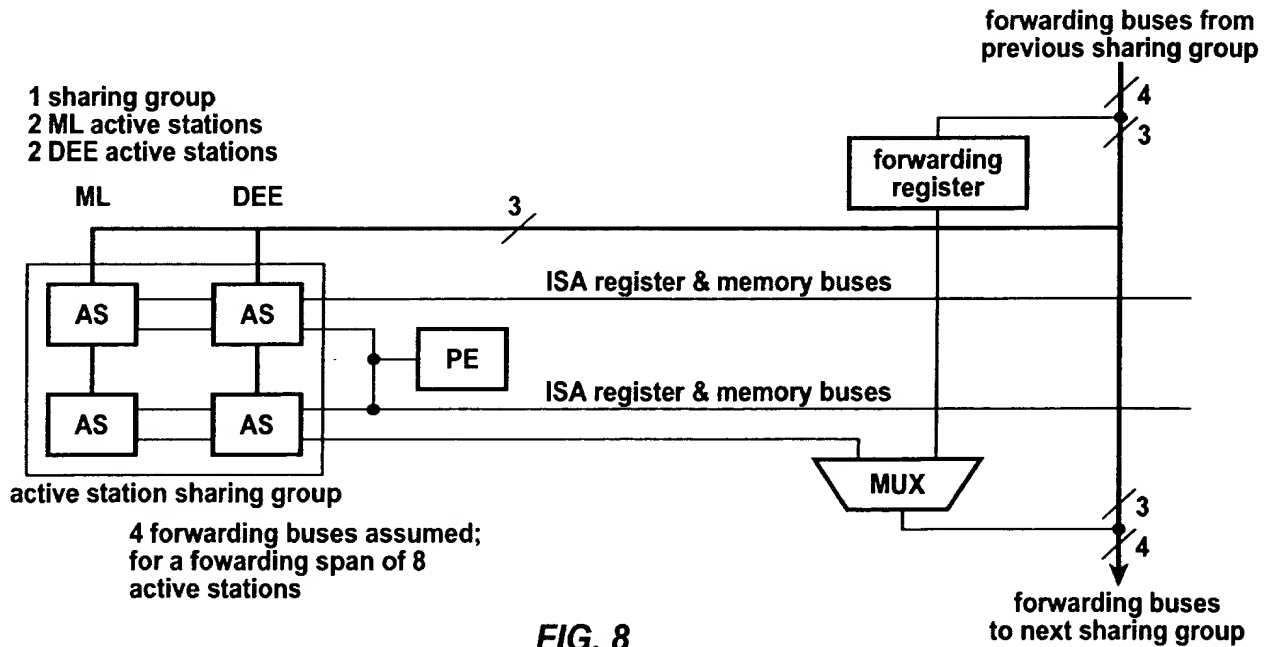active stations

forwarding buses
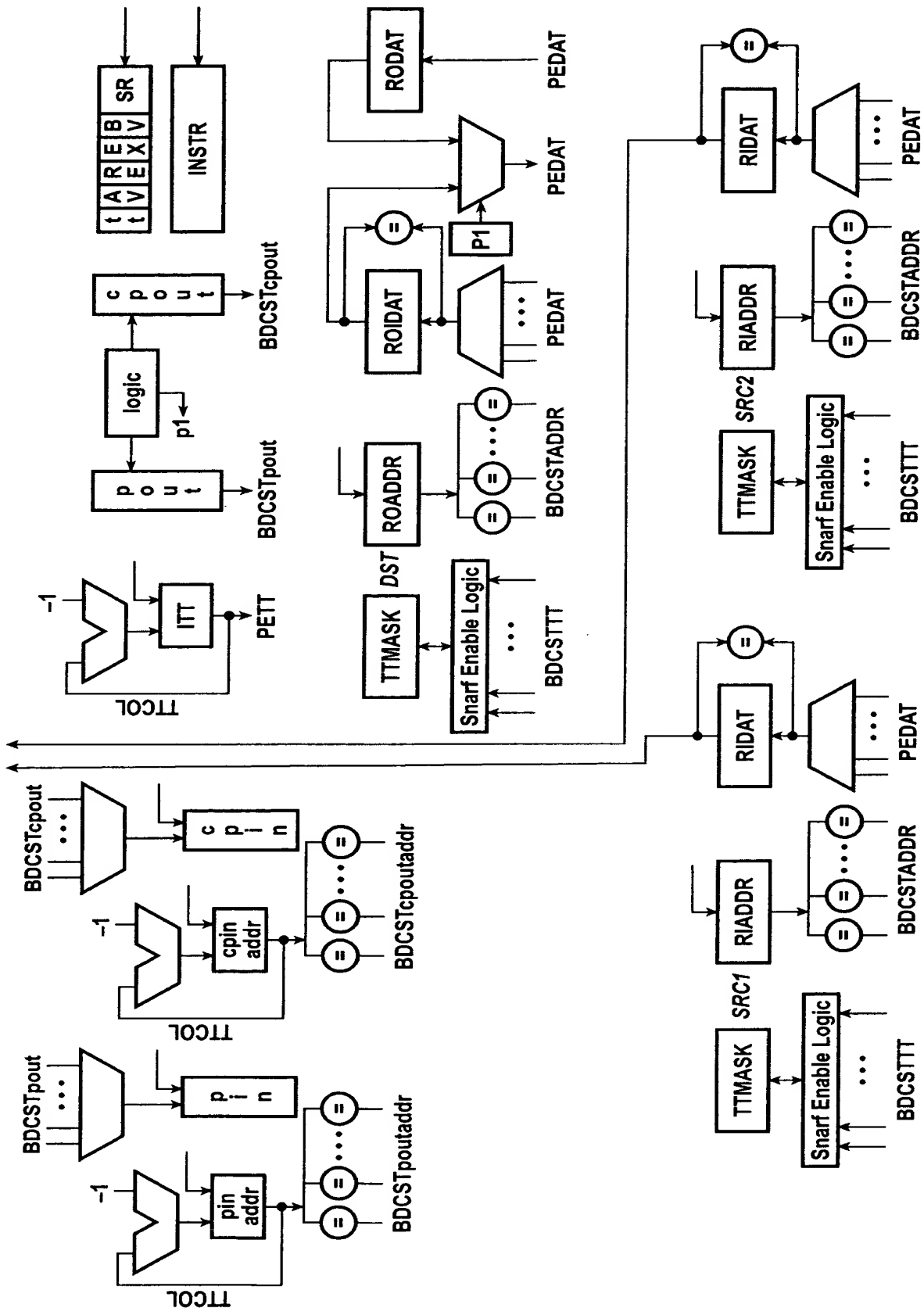to next sharing group

FIG. 8

FIG. 9

ISA Register File Detail

two register files shown;
two registers shown per
register file

register transfer and
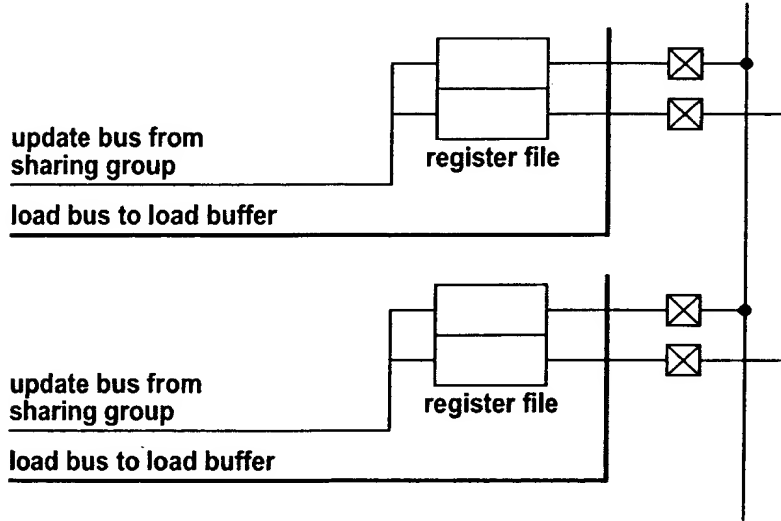column contention buses
for each register

update bus from
sharing group

register file

load bus to load buffer

update bus from
sharing group

register file

load bus to load buffer

FIG. 10

time

00	X						
10	X						
20	X						
30	X	X					

instruction

an 'X' marks an execution

FIG. 11

time

00	X						
10	X						
20			X				
30		X		X			

instruction

an 'X' marks an execution

FIG. 12

time

00		X					
10	X		X				
20	X						
30							

instruction

an 'X' marks an execution

FIG. 13

time

instruction	0	1	2	3	4	5	6
00		X				X	
10	X		X				X
20				X			
30		X	X		X		

an 'X' marks an execution

FIG. 14

time

instruction	0	1	2	3	4	5	6
000	X						
010	X		X				
020	X			X			
030	X				X		

an 'X' marks an execution

FIG. 15

time

instruction	0	1	2	3	4	5	6
00	X						
10	X	X					
20	X		R				
30	X						

an 'X' marks an execution,
an 'R' marks a relay operation

FIG. 16

time

instruction	0	1	2	3	4	5	6
00			X				
10				X			
20	X				R		
30		X				X	

an 'X' marks an execution,
an 'R' marks a relay operation

FIG. 17

time

instruction	0	1	2	3	4	5	6
00	X				X		
10	X	X				X	
20	R		D				B
30	X						

an 'X' marks an execution,
an 'R' marks a relay operation,
a 'B' marks a broadcast-only operation,
a 'D' marks an execution in a DEE path

FIG. 18